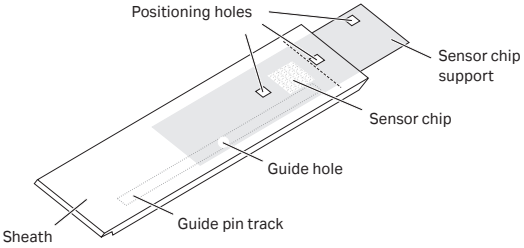
Sensor Chip SA

Instructions for Use

Product description

Order code:	BR100032 (Package of three sensor chips) BR100398 (Package of one sensor chip)
Storage:	The use-before date applies to chips stored at 2°C to 8°C in unopened pouches.



The sensor chip is fixed to a polystyrene sensor chip support. Each cassette, consisting of a sensor chip and sheath assembly, is individually packed under a nitrogen atmosphere in a sealed pouch.

Note: *For research use only.*

Application areas

Sensor Chip SA is designed to bind biotinylated molecules for interaction analysis in Biacore systems. The surface consists of a carboxymethylated dextran matrix pre-immobilized with streptavidin and ready for fast, high-affinity capture of biotinylated ligands, such as peptides, proteins, and nucleic acids. Sensor Chip SA provides a convenient alternative to covalent coupling for ligands that are difficult to immobilize directly or do not withstand covalent immobilization. Controlled biotinylation enables orientated capture.

Refer to *cytiva.com/biacore* for updates on applications and scientific publications.

Preparation of biotinylated ligand

Substitution levels of about one biotin residue per ligand molecule are recommended for capture using Sensor Chip SA. In general, procedures supplied with commercial biotinylation reagents tend to give higher substitution levels. When using N-hydroxysuccinimide (NHS)-biotin reagents for ligand biotinylation, reduce the concentration of reagent to about 1 to 2 moles of reagent per mole of ligand.

It is essential that excess biotinylation reagent is removed from the ligand preparation before capture, to avoid competition with the biotinylated ligand for the binding site on Sensor Chip SA. Separate the biotinylated ligand from excess reagent using for example size-exclusion chromatography (micro-spin columns are recommended for volumes below 120 µL to minimize dilution). Use two cycles of separation to ensure that no free reagent remains in the ligand preparation.

Preparations for immobilization

The following preparations require a running buffer that has been filtered (0.22 µm), and degassed for systems that do not have an integrated buffer degasser.

Cleaning the flow system

Make sure that the flow system is clean before docking Sensor Chip SA, particularly after experiments using other biotinylated molecules. Follow the steps below to perform a flow system cleaning.

Note: *Perform any cleaning steps before docking Sensor Chip SA.*

Step	Action
1	Run the maintenance tool ***Desorb***.

Step	Action
2	If the ***Sanitize*** maintenance tool has been run, prime all buffer inlets that will be used in analysis with running buffer. ***Note:*** *The chip surface is sensitive to sodium hypochlorite residues.* ***Note:*** *Do not use plain water as running buffer at this stage.*

Preparations for use

Step	Action
1	Allow the sealed sensor chip pouch to equilibrate at room temperature for 15 to 30 minutes in order to prevent condensation on the chip surface.
2	Prepare the Biacore instrument with running buffer.
3	Open the sensor chip pouch. Make sure that the sensor chip support remains fully inserted into the sheath at all times.
4	Dock the sensor chip in the instrument as described in the instrument handbook. ***Note:*** *Sensor chips that are not docked in the instrument should be stored in closed containers.*

Immobilization of the ligand

Biotinylated ligand is immobilized on Sensor Chip SA by non-covalent capture (binding to streptavidin).

General recommendations

- If possible, include detergent in the running buffer used for immobilization. HBS-EP+ or HBS-EP are recommended as running buffer.
- Condition the sensor surface with three consecutive one-minute injections of 1 M NaCl in 50 mM NaOH before ligand is immobilized.
- Include an extra wash (see *Appendix: extra wash, on page 5*) using 50% isopropanol in 1 M NaCl and 50 mM NaOH after each ligand injection. This solution does not pass over the sensor surface. Prepare the wash solution by mixing equal volumes of isopropanol and 2 M NaCl in 100 mM NaOH, and use within a week.

Note: *In systems with serial flow cells (FC), it is important to avoid carry over of biotinylated ligand from one immobilization to a consecutive flow cell. For best performance, perform separate immobilizations for each flow cell, starting with FC4, followed by FC3, FC2, and FC1.*

Immobilization

Inject the biotinylated ligand. Ligand concentrations may be as low as in the pM range. Ligands usually bind rapidly to the streptavidin and equilibrium binding is achieved with short contact times, typically 1 minute. To control the immobilization level for ligands requiring short contact times, adjust the ligand concentration. Use a low flow rate to reduce consumption of ligand.

For PCR products, include NaCl at a concentration of 0.5 M or higher in the ligand buffer and use longer contact times, typically up to 30 minutes.

Note: *Injection of blocking reagent in systems with serial flow cells is not recommended, since the blocking reagent may carry over to adjacent flow cells and reduce the ligand immobilization capacity.*

For more detailed information on immobilization strategies and procedures, refer to *Biacore Sensor Surface Handbook (BR100571)*.

Interaction analysis

Interaction analysis is performed by injection of samples over the sensor chip surface. Analyte molecules in the injected sample bind directly to the captured ligand.

Refer to Biacore handbooks and *cytiva.com/biacore* for details on experimental protocols and methodology.

Regeneration

Regenerate the surface by removing the analyte from the captured ligand. Conditions should be chosen to achieve complete dissociation of the analyte without affecting the binding characteristics of the ligand. The surface of Sensor Chip SA is resistant to a wide range of agents for this purpose (see information below). The choice of regeneration procedure may be limited by the stability of the ligand.

Avoid using basic regeneration solution if possible. In some cases, exposure to basic conditions has been seen to cause leaching of the biotinylated ligand from the sensor surface with contamination of downstream flow cells as a result.

Refer to *Biacore Sensor Surface Handbook (BR100571)* for more detailed information on regeneration strategies.

Chemical resistance

The surface of Sensor Chip SA is resistant to one-minute pulses of many commonly used agents. See table below for information of common agents compatible with Sensor Chip SA.

Agent	Concentration
Acetonitrile	30%
DMSO	10%
DTE	0.1 M
EDTA	0.35 M
Ethanol	70%
Ethanolamine	1 M
Ethylene glycol	100%
Formamide	40%
Formic acid	20%
Glycine pH 1.5 to 3.0	100 mM
HCl	100 mM
Imidazole	300 mM
$MgCl_2$	4 M
NaOH	100 mM
NaCl	5 M
SDS	0.5%
Surfactant P20	5%
Urea	8 M

Appendix: extra wash

Follow the instructions below to add and run the extra wash.

In Biacore X100:

- Use the ***Extra wash*** command.

Note: *Conveniently, the wash solution may be prepared as a stock solution of 100 mM NaOH and 2 M NaCl. The solution can be stored at 20°C for a month and mixed 1:1 with isopropanol when the wash solution is needed. The wash solution (50% isopropanol in 50 mM NaOH and 1 M NaCl) can be stored at 20°C and should be used within a week.*

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